

Future VR: **Progress in VR** **Devices** **For Museums** **August, 2001**

Dan Sandin
Director
Electronic Visualization Lab
U of Illinois Chicago



University of Illinois at Chicago

Electronic Visualization Laboratory



25 years

University of Illinois at Chicago



Electronic Visualization Laboratory (EVL)

- **27 years at UIC**
- **Joint program: UIC EECS and Art**
 - **Directors Tom Defanti CS, Dan Sandin ART**
- **50 graduate students**
 - **30 EECS 20 ART**
- **Both scientific research and art exhibition**
 - **develop the medium and the content**
 - **over 1 Hundred art shows**



CAVE Research and Development



1992—Prototype CAVE

**1993—10'x10'x10'
CAVE**

**1994—SIGGRAPH
VROOM**

**1997—100 CAVES and
derivatives worldwide**

**1997- ... NSF funding
for CAVERN and new
desktop VR devices
for the Grid, STAR TAP
and NCSA**

**University of Illinois at Chicago
2001 - BAT CAVE**

BAT CAVE

Bright Advanced Technology

Super Bright Black Screen

- Better Color, better Contrast



BAT CAVE

Super Bright Black Screen

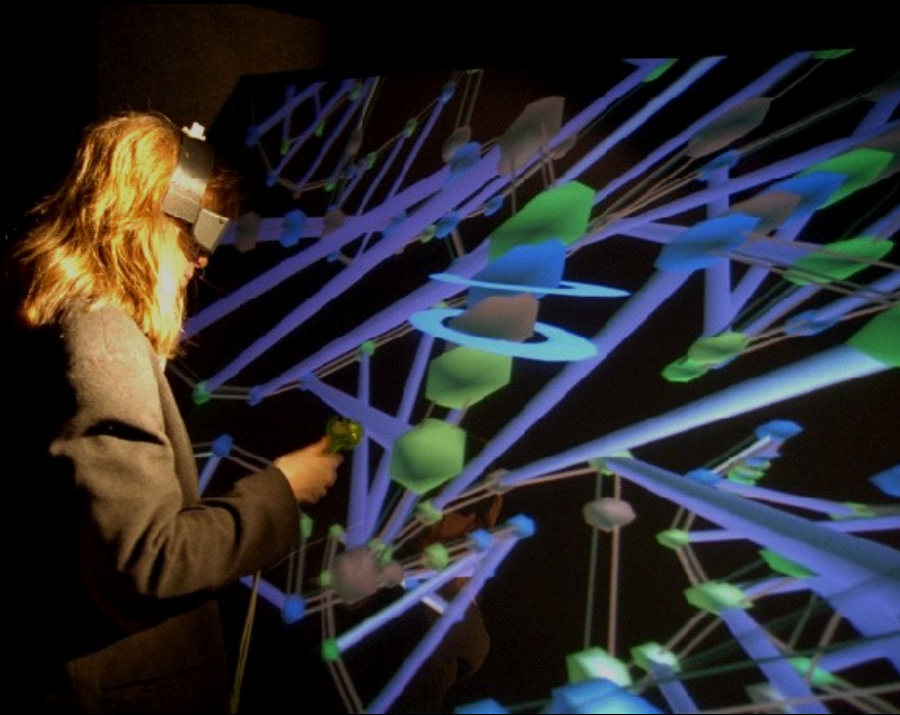
- Mirage 5000 DLP Field sequential stereo



Four Essentials of Virtual Reality

1. Surround vision

- Get close to the screen



Four Essentials of Virtual Reality

2. Stereo

- 2 Display screens
- Multiplexing



Four Essentials of Virtual Reality

3. Viewer-centered perspective

- First redefinition of perspective since the Renaissance

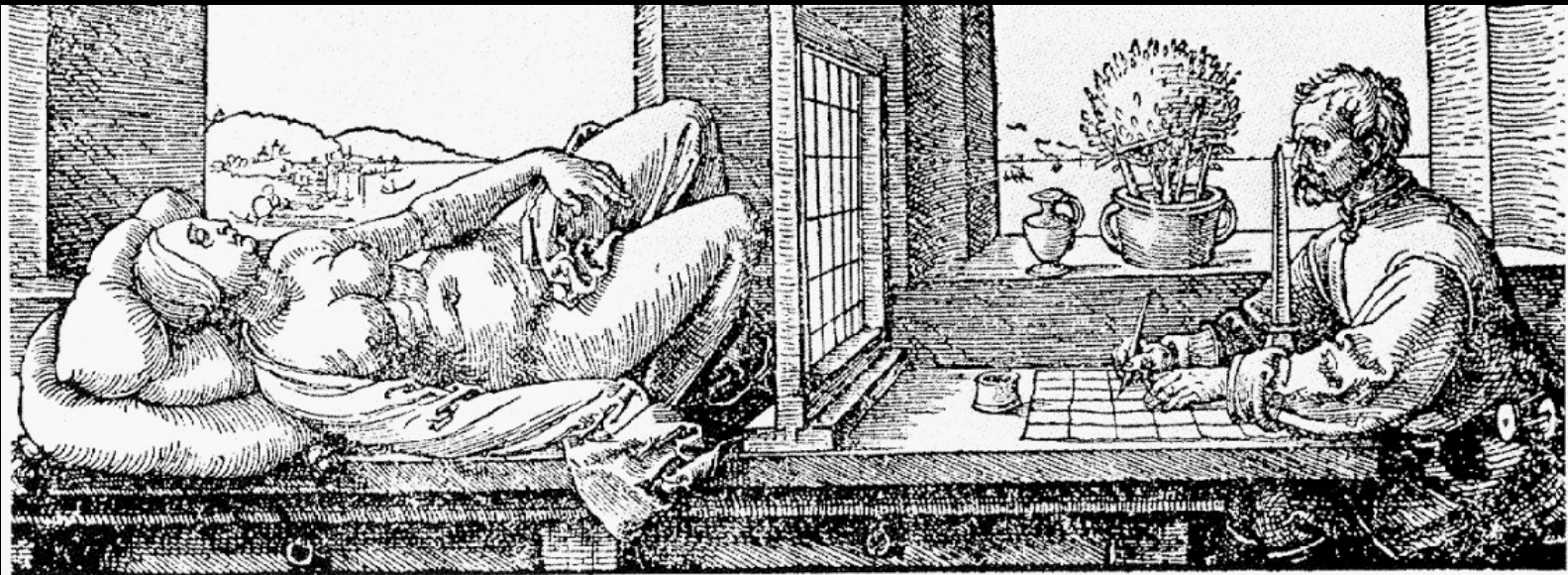
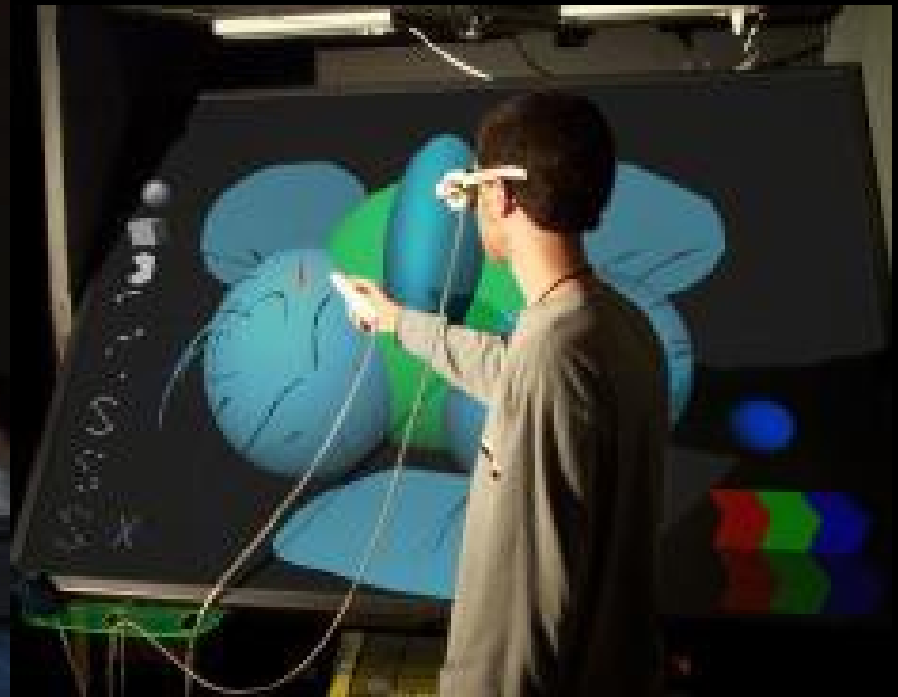


Fig. 2. Albrecht Dürer, *The Designer of the Lying Woman*. In this version of the Constructive Algorithm, the point of view is fixed by a small obelisk marking the place where the artist moves his eye to take readings. The picture plane is the framed grid of strings. A matching grid is drawn on the paper and used to transfer points from the picture plane.

Four Essentials of Virtual Reality

4. Interaction



Caves in Art Museums

- **Ars Electronica Center**
 - Linz, Austria
- **ICC**
 - Tokyo, Japan



Caves at Conferences showing art content

- **Siggraph several times**
- **Super Computing several times**
- **ISEA**
- **Total Museum**
- **NAB**
- **and more**



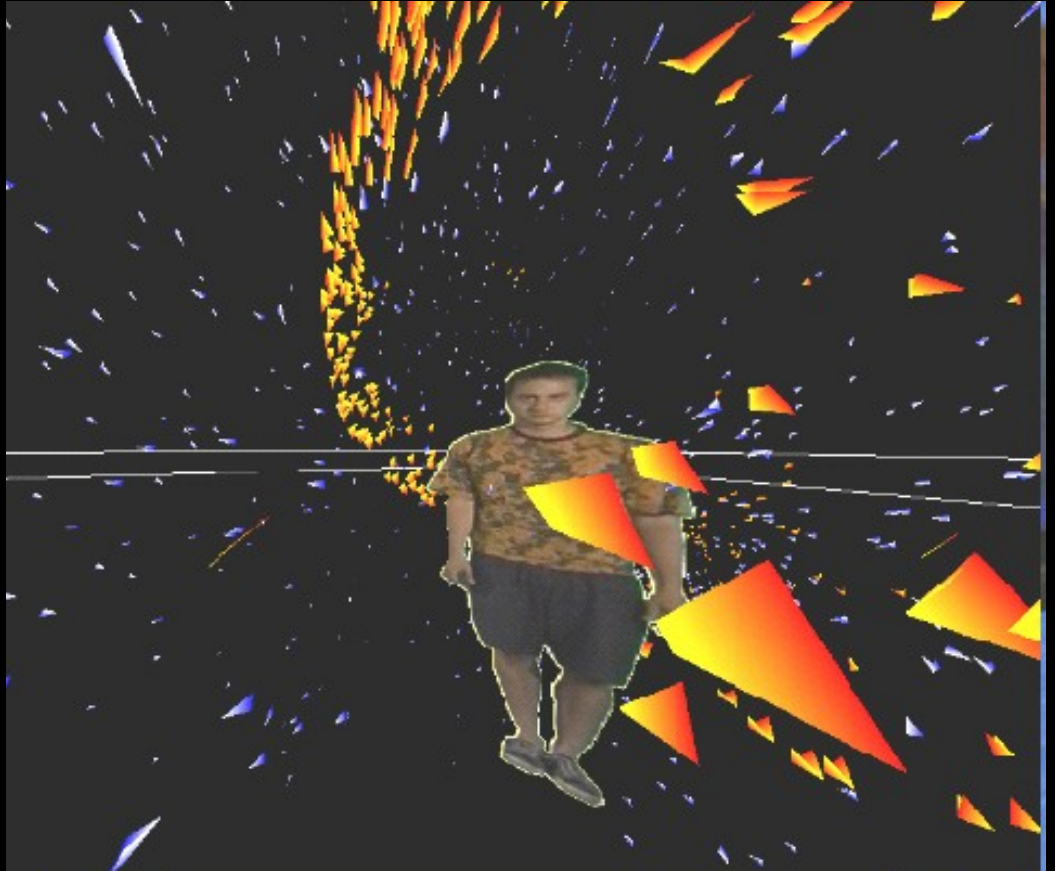
Caves art showings

- **Artists working with CAVEs can Show there work in relatively small number of places**
- **EVL have shown at least 100 VR art works in the last 10 years**



Caves in Art Museums

- **Gallery of Motions**



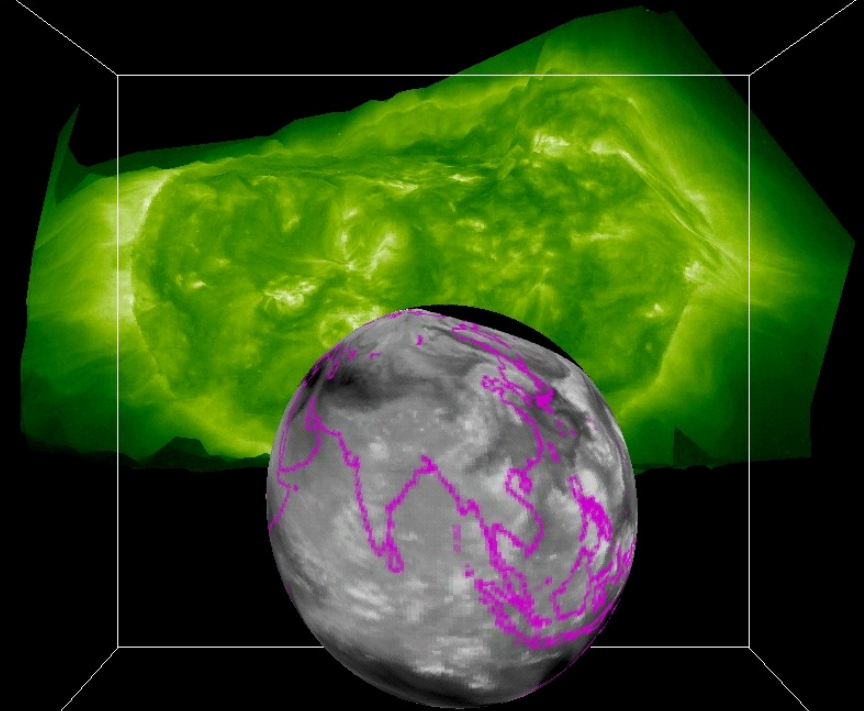
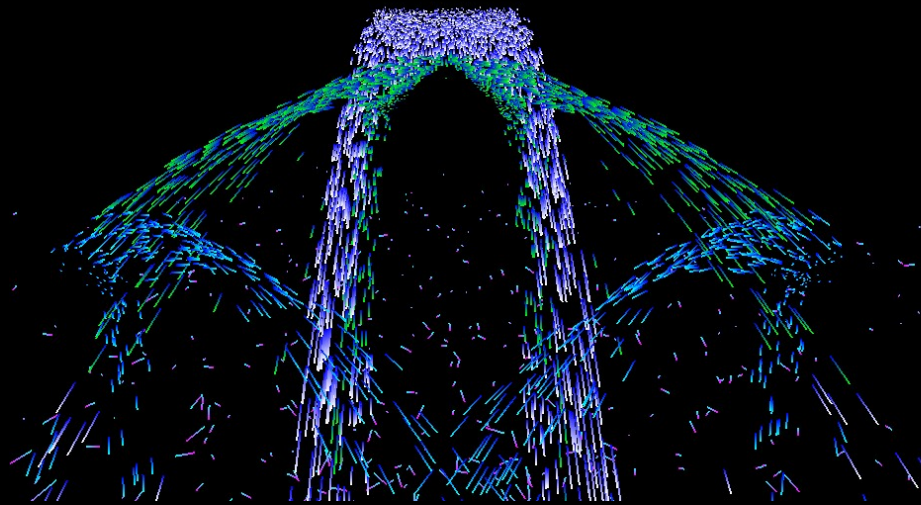
Caves in Art Museums

- **From Death's Door to the Garden Peninsula**



Caves in Art Museums

- Looking for water AEC this fall
 - shared CAVES



Problems with Caves in Art Museums

- **Cost too much**
- **Hard to maintain**
- **Too little throughput**
- **Glasses and tethered tracking systems**
- **Art museums think of VR Installations**
- **Not a medium, as in movies**
- **Innovation a negative**



Problems with Caves in Art Museums

- **They cost too much money**
 - **\$1,000,000 US + remodeling**
 - **remodeling is highest cost**
 - **the Onyx is second**
 - **structure and projectors**
 - **trackers, wands etc**



Problems with Caves in Art Museums

- **Hard to maintain**
 - **technical staff is required**
 - **museums have staff**
 - **conservators ,janitors, etc**
 - **so why not technical staff**



Problems with Caves in Art Museums

- **They have too little throughput**
 - around one person a minute
 - long lines
 - tickets
- **More problematic for the artist and audience is limited interaction**



Problems with Caves in Art Museums

- **Art museums think Installations not a medium as in a movie theater**
 - **move new content through the theater**
 - **there are many strong VR pieces that could travel between Museums**
- **Innovation a negative ,Photo took 100 Yr.**



Virtual Reality Displays for museums and galleries

- **ImmersaDesk**
 - 1994
 - meant for art galleries
 - shippable, AV ready
 - adjustable
 - still too expensive
 - otherwise very successful in art environments



Virtual Reality Display for museums and galleries

- **ElsieDesk**
 - front projected
 - passive stereo
 - larger audience



Full head tracked Stereo Wide angle of view (real VR)

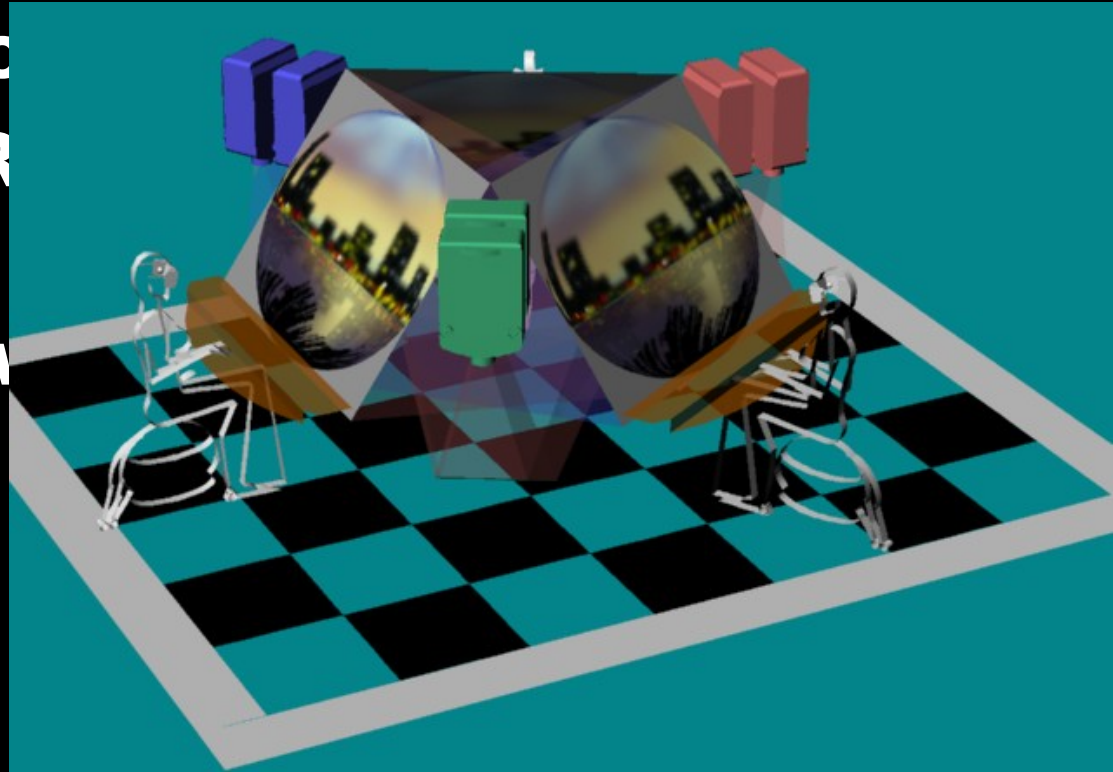
- **Cost Estimate**

- **PC - \$5000-10000**
- **polarization-preserving screen \$320**
- **2 DLP projectors - \$10000**
- **100 pairs of glasses - \$50**
- **polarizing filters and projector mounts - \$1000**
- **Wanda 3D Joystick - \$2560**
- **tracker \$4,500 - \$10,000**



Virtual Reality Display for museum

- **TryDesk , So Cheap why not 3**
 - rear projected
 - passive stereo
 - one on one VR
 - Designs by Greg Davis



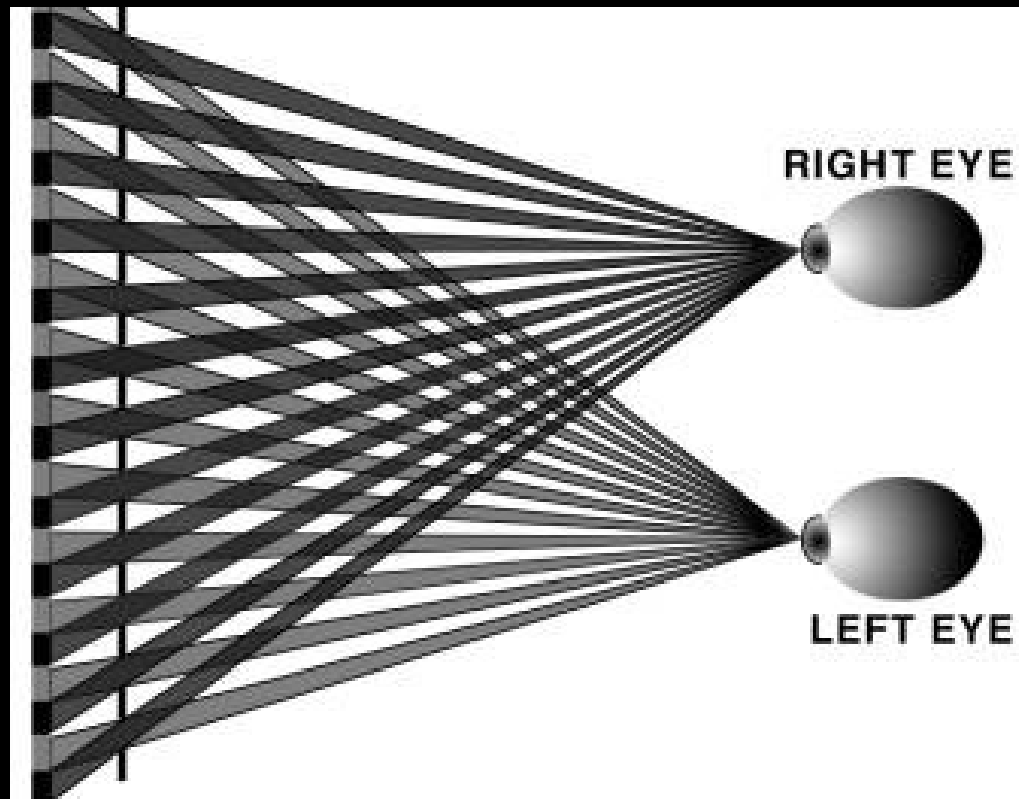
Varrier™ strip Auto-Stereo

- No Glasses
- combine with video tracking



Varrier[™] strip Auto-Stereo

- Barrier strip method



More VR in art contexts

- **Encourage large art institutions to invest in infrastructure**
 - equipment
 - technical staff
 - artist support
- **Develop cheaper lighter weight easier to maintain VR display systems**

